UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 16, 1997

Baldwin Park Operable Unit Steering Committee
c/o Donald E. Vanderkar, Steering Committee Co-Chair
Aerojet General Corporation
Box 13222
Sacramento, CA 95813

Subject: Request for Response to Remaining Comments on Phase 1 Treatability Study Work Plan, Perchlorate in Groundwater, Baldwin Park Operable Unit, San Gabriel Basin, dated August 26, 1997

Dear Mr. Vanderkar:

We have completed our review of the revised Treatability Study Workplan, dated October 6, 1997. We appreciate the revisions made to the report in response to our September 12, 1997 comments, but are unable to find responses to several comments. In an enclosure to this letter, we have noted which comments appeared to remain unaddressed, and provided some new comments on changes apparently made in response to other reviewers. We look forward to discussing these items in a conference call or meeting the week of October 20.

In addition, a portion of the text previously claimed as Confidential Business Information has been deleted from the report. Please clarify whether the deleted portions are still applicable.

Contact me at (415) 744-2256 with any questions or comments.

Sincerely,

Wayne Praskins
EPA Project Manager

Enclosure

EPA COMMENTS ON AUGUST 26, 1997 TREATABILITY STUDY WORKPLAN AND HLA RESPONSES TO EPA COMMENTS

Page/ Column/ Section (in draft version)	Comment	Response
page 3/ column 2/ section 2.3	Please identify the "higher than normal level of quality control precautions" that will be taken.	OK
page 7 / column 2/ section 4.2	Please specify the perchlorate concentration or concentration range that is "representative of that anticipated in San Gabriel Basin."	OK
page 7/ column 2/ section 4.3	We understand that biological denitrification has been used directly on a drinking water system in France in a 5 MGD system, and indirectly on a drinking water supply in El Paso, Texas.	OK
page 8/ column 1/ section 4.3	Please specify the nitrate concentration or concentration range that is "similar to that expected in San Gabriel Basin."	OK
page 8/ column 1/ section 4.5	We expect that phase 2 testing can begin earlier than April 1998. As explained in the EPA letter dated 8/28/97, we expect that the Steering Committee will submit the following documents within 75 calendar days of EPA approval of the workplan: a written phase 1 progress report for treatability testing of the biological process that includes a description of and schedule for the remaining phase 1 testing and either: (i) a supplemental workplan for phase 2 treatability studies; or (ii) a detailed explanation why additional phase 1 testing is necessary before preparation of a phase 2 workplan and planned submittal date for the phase 2 workplan.	We agree with the narrative on page 8 (Section 4.5) and page 13 (Section 10.0), but believe that tasks planned for completion after 11/27/97 can be finished and submitted earlier. Specifically, we believe that in the absence of unforseen difficulties during pilot-scale testing, "Phase 1 testing" can be completed before 12/27/97. We also believe that "Draft Phase 1 Report" can be submitted well before 2/25/98. The proposed schedule allows an unnecessarily lengthy 6 1/2 weeks after the end of testing for report preparation. We assume that the last two dates provided in Section 10 are in 1998, not 1997.

Page/ Column/ Section (in draft version)	Comment	Response
page 8/ column 2/ section 4.5	One of the objectives listed for phase 2 is to evaluate the relative bacterial preference for perchlorate and nitrate. The treatability study should examine other parameters relevant to microbially-catalyzed oxidation-reduction reactions, including the presence and depletion of competing electron acceptors. Measurement of these parameters may provide information that can be used to optimize removal rates, reduce operating costs, and diagnose the cause of lower than expected perchlorate removal rates. These processes are commonly examined during evaluations of biological degradation and natural attenuation in groundwater (e.g., see *Technical Protocol for Natural Attenuation of Chlorinated Solvents in Groundwater*, by T.H. Wiedemeier et. al.). Parameters commonly measured during studies of biological degradation and natural attenuation include: * iron II (Fe^{+2}) - reaction product for competing redox reaction (iron reduction) * sulfate and sulfide - competing electron acceptor and reaction product (sulfate reduction) * methane - reaction product for competing redox reaction (methanogenesis) * oxidation-reduction potential - indicator of type of redox reactions that may occur. Consideration should also be given to measurement of additional chlorine compounds, and preparation of a mass balance of all chlorine species, in order to determine whether the perchlorate is fully reduced to chloride. Other possible chlorinated products include chlorate, chlorite, and hypochlorite.	Text and Tables in revised workplan include measurement or analysis of sulfate, redox potential, chlorate, chlorite, and hypochlorite. Sulfide is not mentioned in text, but included in Tables 7.1 and 7.3. Fe^{+2} and methane are not mentioned in the text or Tables.
Figure 5-1	The photograph of the pilot unit shows an air compressor, oxygen generator, bubble contactor, and dissolved oxygen control meter. Presumably, these will not be used during the treatability study.	OK
Figure 5-2	The Process and Instrumentation Diagram also shows an Oxygen Generation System and recycling line. Please correct the diagram or explain the need for this equipment. Also, please add other system components described elsewhere in the workplan (e.g., air stripper, filters, effluent pumps, recycle line, backwash line, backwash pumps, effluent equalization tank, 20,000 gallon storage tank, sample ports).	Please provide a schematic showing the relationship between major system components. Describe the purpose of any components not discussed in the text. If preferred, provide as separate document.

Page/ Column/ Section (in draft version)	Comment	Response
page 8/ column 2/ section 5.0	Should tests also be conducted in reverse order: through the biological unit first, followed by air stripping? Isn't the biological process likely to remove some of the VOCs, offering the potential to reduce air stripping and/or offgas control costs?	Not addressed in Workplan.
page 9/ column 2/ section 5.0	Will the methanol in denatured alcohol limit the end use of the water? Should methanol be analyzed for in the effluent? Water temperature should be measured, given the potential temperature dependence of reaction rate. If the water temperature in the reactor may be cooler than San Gabriel basin groundwater (as implied by need for heat tracing on the filtration line), should water temperature be adjusted? The text describes the effluent being discharged into a 550 gallon equalization tank. Is this tank for solids removal? Figure 5-2 shows an equalization separation tank on the influent line. What is the purpose of this tank?	"Alcohol" specified as carbon source/electron donor in revised workplan. Possible impact of methanol not discussed. Need for water temperature adjustment not discussed. Purpose of equalization tanks (2) not discussed.
page 10/ column 2/ section 6.1	Should the expected organic loading rate reflect the difference in perchlorate concentration between Sacramento and Baldwin Park? The workplan states that "targeted analytical parameters will be measured after each change in operating conditions." How long is needed for stabilization - minutes or hours? Perhaps a parameter vs. time curve should be generated to determine the optimal time for sample collection after a change in operational conditions.	The revised workplan states that: *"initial and target loading rates were developed based on previous work, and considering influent water quality..."* How was this information used to estimate loading rates? How do planned loading rates compare to previous studies? The revised workplan states that: *"approximately 24 hours will be allowed to pass and daily samples collected before additional changes are made."* Does this statement mean that daily samples will be collected 24 hours after a change in operating conditions?

Page/ Column/ Section (in draft version)	Comment	Response
page 11/ column 1/ section 7.1	The workplan states that DO concentrations in the influent and effluent of the GAC/FB system will be monitored daily. We assume that these measurements will be made at ports at sample ports located on the influent and effluent lines immediately adjacent to the reactor vessel. Please show the locations of the recycle line and sample ports on Figure 5-2.	Project-specific schematic not provided.
page 11/ column 2 / section 7.2	The source water for the treatability testing should be sampled for anions, metals, general water chemistry, and other parameters that might affect system performance. Why collect the effluent ethanol samples as composites rather than grab samples?	Analysis of source water not specifically addressed. Will "GAC/FB influent" be identical to source water? Comment requesting explanation for collection of composite samples not addressed.
page 12/ column 1/ section 7.3	The list of analytes should include parameters mentioned in the comment on page 8, column 2, section 4.5.	See earlier comment.
page 12/ column 2/ section 10.0	The schedule should be modified as explained in the comment on page 8, column 1, section 4.5.	See earlier comment.

We would also like to discuss the following new comments. They are primarily about changes in the Workplan apparently made in response to other reviewers.

Page/ Column/ Section (in revised version)	Comment
page 8/ column 2/ section 5.0	How likely is it that an additional treatment step will be needed to remove residual alcohol?
page 9/ column 2/ section 5.0	Why is filtration no longer believed to be needed? Why does the Workplan no longer specify a 20,000 gallon backup tank for discharge of effluent, or a recycle line?
page 10/ column 2/ section 6.3	The text states that approximately 5% of all samples will be collected as splits. How will these samples be chosen? Will these analyses be in addition to the duplicates listed in Table 7.2? The text also states that field blanks, equipment blanks, and trip blanks will be submitted daily or weekly. Is this correct?
page 12/ column 1/ section 8.0	Please describe the process for obtaining Regional Water Quality Control Board approval for discharge of treated water.
page 13/ section 10.0	Did DHS or MWD review the workplan, as described in the schedule?
Table 7.3	The MDL for perchlorate appears to be incorrectly reported as 28 ug/l.